Introduction:
Diminished urinary output (UO) is largely used as marker of acute kidney injury (AKI) in critically ill patients. We aimed to explore the role of urinary output on incidence and mortality of AKI developed during ICU admission.

Methods:
The study population consists of all patients admitted between 2007 and 2018 to one of the Dutch ICUs included in the NICE database with an ICU length of stay of at least 48 hours, having daily measurement of creatinine and UO. Only patients without renal replacement therapy that have a serum creatinine lower than 1.1 mg/dl (97.5 μmol/L) or a UO above 0.5 ml/kg/h on the day of the index ICU admission were considered at risk for AKI. Patients were followed during their ICU stay and classified according to the highest KDIGO criteria reached based on creatinine alone (model 1) and creatinine plus UO (model 2) using ICU admission serum creatinine as baseline. In both models, patients were classified as: no AKI, renal impairment at the first day of ICU admission, AKI stage 1, AKI stage 2, and AKI stage 3.

Results:
We identified 52,863 patients (60% male, mean age 63 years, median ICU-LOS 4 days). Of those, 51.2% of patients had renal impairment at the first day of ICU admission. Among the remaining patients, 44.4% in model 1 and 29.9% in model 2 were classified as having no AKI, 2.6% and 1.4% as AKI stage 1, 0.7% and 9.3% as AKI stage 2, and 1.1% and 8.2% as AKI stage 3, respectively. Survival at 30-day markedly differed according to the AKI classification model used (Figure). Similarly, adjusted HRs for 30-day mortality differed among patients with and without AKI compared to patients with renal impairment at the first day of ICU admission (Figure).

Conclusion:
Among patients admitted to the ICU 50% had renal impairment at the first day of ICU admission. Our findings suggested that UO plays an important role both on AKI incidence and mortality and should be carefully interpret in the clinical setting especially in AKI stage 2 classification.
Figure. Thirty-day survival according to AKI classification model 1 and model 2. Hazard Ratios (HRs) for 30-day mortality adjusted by sex, age, type of admission, APACHE IV score, SOFA score at day of admission (excluded renal SOFA score) for patients with AKI classified with model 1 and model 2.